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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/796,146	03/10/2004	Mizuhisa Nihei	040102	2043

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WASHINGTON, DC 20006

EXAMINER

PHAM, THANHHA S

ART UNIT	PAPER NUMBER
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2813

DATE MAILED: 12/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/796,146	Applicant(s) NIHEI ET AL.	
	Examiner Thanhha Pham	Art Unit 2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 02 October 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) 11-29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

This Office Action is in response to Applicant's Response dated 10/02/2006.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

- 1. Claims 2-6, and 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

► With respect to claim 2,

it is not clear that "a hole" and "the hole" as cited in claim 2 is the same or different to "a hole" as cited on line 3 of claim 1. Applicant is respectfully suggested to clarify and use appropriate consistent claimed language to clarify scope of claim.

► With respect to claim 9,

it is not clear that "a HEMT" as cited on line 2 of claim 9 is the same or different to "a HEMT" as cited on line 4 of claim 9. Applicant is respectfully suggested to clarify and to use appropriate claimed language to clarify scope of claim.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

**2. Claims 1 and 7-8 are rejected under 35 U.S.C. 102(e) as being anticipated by Den et al [US 6,628,053].**

► With respect to claim 1,

Den et al (fig 8D, cols 1-21) discloses the claimed semiconductor device comprising:

a SiC substrate (22, col 9 lines 3-7);

a heat conductor (24, carbon nanotube inherently has characteristics of a heat conductor) formed in a hole in the SiC substrate and made of a linear structure of carbon elements.

► With respect to claims 7-8,

Den et al (fig 8D, cols 1-21) discloses the claimed semiconductor device comprising:

a SiC substrate (22, col 9 lines 3-7);

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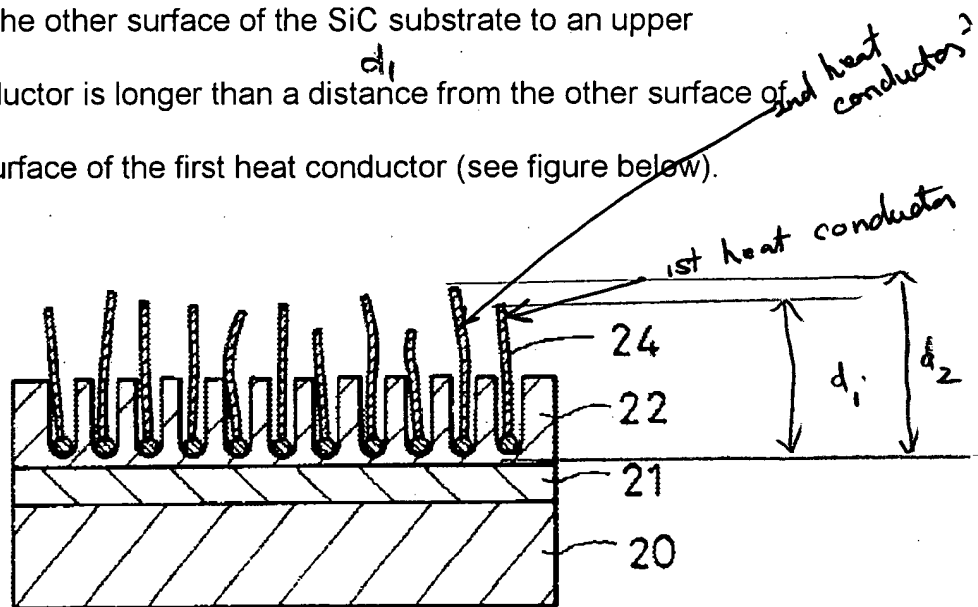
a first heat conductor (24, carbon nanotube inherently has characteristics of a heat conductor, see figure below) formed in a first hole in one surface of the SiC substrate and made of a linear structure of carbon elements;

a second heat conductor (24, carbon nanotube inherently has characteristics of a heat conductor, see figure below) formed in a second hole in the one surface of the SiC substrate to be spaced from the first hole at interval, the second heat conductor made of a linear structure of carbon elements; and

an element (21) formed on an other surface of the SiC substrate,

wherein a distance  $d_2$  from the other surface of the SiC substrate to an upper surface of the second heat conductor is longer than a distance  $d_1$  from the other surface of the SiC substrate to an upper surface of the first heat conductor (see figure below).

FIG. 8D



**\*\*\*Notice:** With respect to claim 10, since applicant does not define how a characteristic of "one surface" of the SiC substrate, interpreting the claim in a broad scope, "one surface" as being claimed is any surface being covered entirely by one element 24.

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► With respect to claim 10, Den et al (fig 8D, cols 1-21) discloses the claimed semiconductor device comprising:

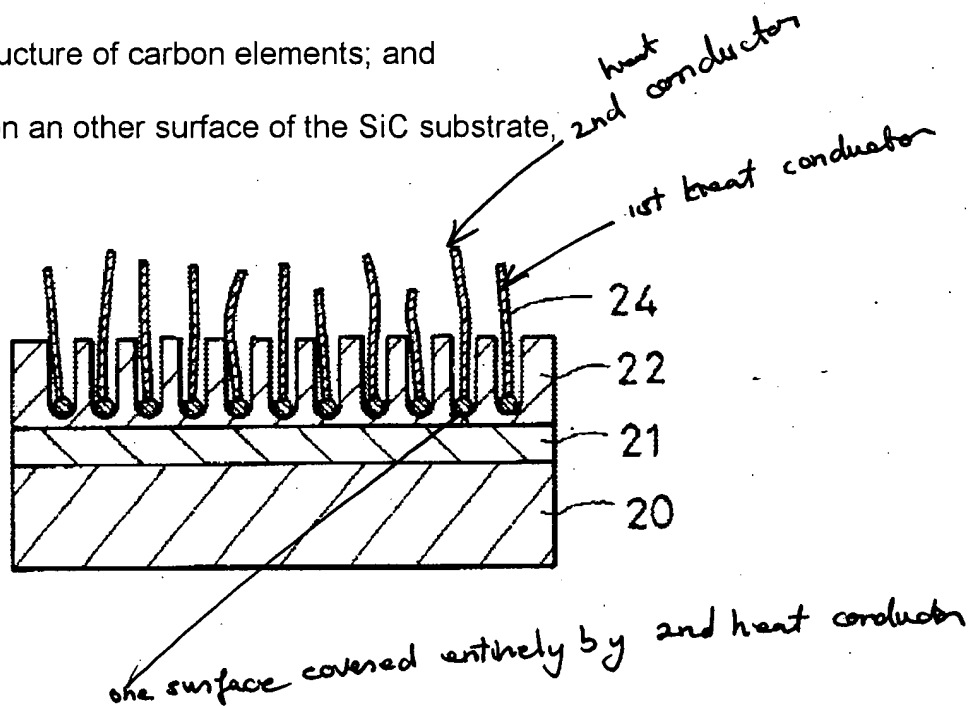
a SiC substrate (22, col 9 lines 3-7);

a first heat conductor (24, carbon nanotube inherently has characteristics of a heat conductor, see figure below) formed in a hole in one surface of the SiC substrate and made of a linear structure of carbon elements;

a second heat conductor (24, carbon nanotube inherently has characteristics of a heat conductor, see figure below) formed to cover one surface of the SiC substrate entirely and made of a linear structure of carbon elements; and

an element (21) formed on an other surface of the SiC substrate,

FIG. 8D



### Conclusion

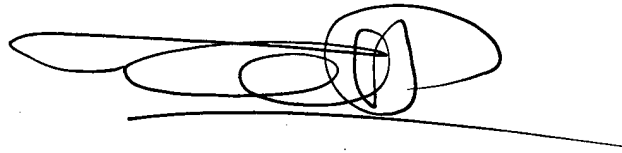
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanhha Pham whose telephone number is (571) 272-1696. The examiner can normally be reached on Monday and Thursday 9:00AM - 9:30PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TSP

A handwritten signature in black ink, consisting of a series of loops and a long horizontal stroke at the bottom.

THANHHA S. PHAM  
PRIMARY EXAMINER